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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,859	05/29/2001	Klony Lieberman	U 013492-2	4495
7590	03/15/2004		EXAMINER	
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			ART UNIT	PAPER NUMBER
			2173	

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/866,859	LIEBERMAN ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Blaine Basom	2173

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-80 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-80 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 29 May 2001 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 5 and 6.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Objections***

Claims 5, 7-8, 15, 19-20, 25-26, 32, 34-35, 38-43, 45-46, 49, 51, 59, 64-66, 68-74, 76, and 78 are objected to because of the following informalities: In claim 5, the phrase “also comprising comprises a personal digital assistant” is objected to as being grammatically improper. As per claim 15, the phrase “directly light from” is objected to as being grammatically improper. In claims 7-8, 19-20, 25-26, 51, and 59, “infra-red” is objected to as being incorrectly spelled; the Examiner believes “infrared” would be more appropriate. Regarding claim 32, the phrase “the projector protects an image” is objected to as being nonsensical. In claims 34-36 and 64-66, the colon (“：“) in the phrase “providing web browsing functionality:” is believed to be used inappropriately; the Examiner maintains that a semicolon (“；”) would be more appropriate instead. Regarding claims 38, 68, 73, and 78, the phrase “output based on user implement actuation” is objected to as being grammatically incorrect. In claims 39-41 and 69, the colon (“：“) in the phrase “providing e mail communication functionality:” is believed to be used inappropriately; the Examiner maintains that a semicolon (“；”) would be more appropriate instead. As per claims 40-43 and 69-73, the word “e mail” is objected to as being incorrectly spelled; the Examiner believes that “email” or “e-mail” would be more appropriate instead. In claims 45-46 and 74, the colon (“：“) in the phrase “providing mobile commerce communication functionality:” is believed to be used inappropriately; the Examiner maintains that a semicolon (“；”) would be more appropriate instead. In reference to claim 49, the phrase “user indication interaction” is inconsistent with previous phrases, which recite “user indicator interaction.” As per claim 59, “51and” is objected to. In regard to claim 76, the phrase “providing at least an

mobile commerce communication output" is objected to as being grammatically incorrect.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 and 21-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 6, there is no antecedent basis for "said personal digital assistant." In claims 21 and 22, there is no antecedent basis for "said visible radiation illuminator." Similarly in claims 27 and 28, there is no antecedent basis for "said at least one visible radiation illuminator."

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-13, 16-17, 19-29, 35-36, 40-41, 45-46, 49-61, 65-66, 70-71, and 75-76 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,614,422, which is attributed to Rafii et al. (and hereafter referred to as “Rafii”). In general, Rafii discusses methods and devices for inputting data and commands into computer systems, particularly “companion computer systems,” such as wireless phones or personal digital assistants (PDAs) (see column 1, line 20 – column 2, line 20). Rafii particularly proposes configuring such companion systems to project an image of a keyboard, which may be used to enter data into the companion system (for example, see column 4, lines 7-33).

Thus regarding claims 1 and 49, Rafii discloses that a companion system may comprise a projector, for projecting an image of at least part of the keyboard onto an inert surface in front of the companion system (see column 4, lines 7-33; and column 10, lines 41-56). Such a companion computer system also includes a sensor, specifically a “three-dimensional sensor,” which is for sensing user interaction with specific locations of the keyboard image (see column 4, lines 7-33; column 5, lines 39-53; column 9, lines 11-20; and column 10, lines 27-40). Lastly, it is understood that this companion system also comprises alpha-numeric information generation circuitry at the output of the sensor, the alpha-numeric information generation circuitry providing alpha numeric output to a display (see column 6, lines 42-58; and column 8, lines 45-63). This companion system described by Rafii is therefore considered an apparatus, like that recited in claim 1, and is considered to teach a method, like that recited in claim 49.

As per claims 2-4 and 50, Rafii discloses that the companion system may be a wireless communicator, specifically a cellular telephone, which is operable to provide alpha-numeric output, such as e-mail, to a receiver (see column 8, lines 25-33; and column 8, lines 45-49). It is

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therefore understood that such a cellular telephone comprises a housing, in which is mounted a projector, a sensor system, and alpha-numeric generation circuitry in order to implement the above-described projected keyboard (for example, see column 4, lines 7-33; column 5, lines 39-53; and column 6, lines 42-58).

In reference to claims 5 and 6, Rafii discloses that the above-described companion computer system may be a personal digital assistant (PDA) (see column 8, lines 25-33; and column 8, lines 45-49). It is therefore understood that such a PDA comprises a housing, in which is mounted a projector, a sensor system, and alpha-numeric generation circuitry (for example, see column 4, lines 7-33; column 5, lines 39-53; and column 6, lines 42-58).

Regarding claims 7-10 and 51-52, Rafii discloses that the above-described sensor comprises an illuminator, namely a "light source," which is for directing radiation of a specific wavelength over the image of the keyboard, and a sensor, specifically an array of pixel detectors, which are for sensing any radiation that is scattered, i.e. reflected, by a user indicator interacting with the projected keyboard (see column 10, line 56 – column 11, line 23; column 11, lines 65 – column 12, line 32; and column 13, lines 47-60). Rafii further teaches that the light source may emit light of any known wavelength, and that the array of pixel detectors is used to detect light of the same wavelength emitted by the light source (for example, see column 13, lines 47-60; column 14, lines 20-29; and column 15, line 63 – column 16, line 6). Consequently, it is understood that the light source may emit infrared light or visible light, and that the array of pixel detectors may sense this infrared light or visible light. A light source emitting infrared light is considered an "infra-red illuminator," like that recited in claims 7 and 8, and a light source emitting visible light is considered a "visible light illuminator," like that recited in claims 9 and

10. An array of pixel detectors detecting infrared light is considered an “infra-red sensor,” like that recited in claims 7 and 8, and an array of pixel detectors sensing visible light is considered a “visible radiation sensor,” like that recited in claims 9 and 10.

With respect to claims 19-22 and 55-56, the light source described in the previous paragraph is either a laser or an LED (for example, see column 10, line 57 – column 11, line 2), and is therefore considered a “point source,” like that recited in the claimed invention. Rafii teaches that the light from such a point source passes through a lens, like lens 288’ in figure 3, and is radially directed to optically *cover* the projected keyboard (see column 13, lines 40-46; and note the light rays 140 in figures 1A and 1B, as are described in column 10, lines 27-34). Thus light emitted from the point light source is radially directed from the point source, and is projected onto a flat surface. Consequently, the infra-red illuminator or visible light illuminator taught by Rafii, and described in the previous paragraph, is understood to comprise a “cylindrical reflecting element” like that recited in each of claims 19-22, which is for reflecting light from a point source and producing a generally flat, generally radially-directed light distribution.

Regarding claims 25-28 and 59-60, the illuminator taught by Rafii is operative to direct radiation at a plurality of levels, designated by “Y-axis” locations, over the projected keyboard image, and the sensor taught by Rafii is operative to sense radiation scattered, i.e. reflected, by a user indicator at a plurality of locations there along (for example, see figure 3; column 11, lines 8-23; and column 12, lines 18-47). This is done to determine, in part, the Y-axis position of the user indicator, or in other words, the height of the user indicator above the projected keyboard. Lastly, as is described above in the paragraph regarding claims 7-10, this illuminator of Rafii

may be an infra-red illuminator or a visible radiation illuminator, and this sensor of Rafii may be an infra-red sensor or a visible radiation sensor.

In reference to claims 11-12 and 53-54, Rafii teaches that a user may interact with a projected keyboard using either a stylus or the user's fingers (for example, see column 7, lines 36-54; and column 21, lines 21-54). Thus the "user indicator" recited in claims 1 and 49, and in the above paragraphs, may be a user finger or a stylus.

Regarding claims 23-24 and 57-58, the above-described sensor of Rafii comprises an array of "discrete sensing elements," namely pixel detectors (see column 10, line 57 – column 11, line 23), and a lens operative to image a region overlying each of a plurality of keyboard locations onto a corresponding pixel detector (see column 14, lines 20-29). By this reasoning, the sensor of Rafii is understood to comprise a "position sensitive detector," specifically an array of pixel detectors, and a lens operative to image a region overlying a keyboard location onto a corresponding region of the array of pixel detectors.

As per claims 13, 16, 17, 29, and 61, Rafii discloses that the projector used to project a keyboard image may comprise a point light source, such as a laser, which illuminates a lens with a diffractive pattern delineating a keyboard etched on it (see column 10, lines 41-56). The lens thus serves as a mask defining the image of the keyboard, and therefore, Rafii teaches that the projector comprises a point light source illuminating a mask defining the image of the keyboard. By this reasoning, the projector is considered to comprise a diffractive optical element, specifically this lens having diffractive pattern, which when illuminated produces the keyboard image on an inert surface. As shown in figure 1A, when projected onto an inert surface, the keyboard appears non-distorted even though the projector does not directly (e.g. at a 90° angle)

point to the surface. Such an angle of incident would normally create a distorted keyboard image. Thus it is understood that, to create such a non-distorted image given the angle of projection, the mask of Rafii is formed to define a distorted representation of the keyboard image in order to compensate for distortions in the projector.

Regarding claims 35, 36, 65, and 66, Rafii discloses that the above-described companion computer system may be a “PDA, a wireless telephone, a laptop PC, a pen-based computer, or any other electronic system to which it is desired to input data” (see column 8, lines 29-33). It is consequently understood that this companion computer system may be a wireless communicator providing wireless web browsing functionality, as is well-known in the art. As described above in the rejection for claim 1, the companion computer system of Rafii particularly comprises a projector, a sensor, and alpha-numeric information generation circuitry, like that described in claims 35 and 36, and which projects a an image of a keyboard onto a surface, senses user interaction with specific locations of the projected keyboard image, and generates an alpha-numeric output that may be useful in web browsing, like recited in claims 65 and 66. Such a companion computer system is therefore considered a wireless system, like that recited in claims 35 and 36, and is considered to teach a method, like that recited in claims 65 and 66.

Regarding claims 40, 41, 70, and 71, Rafii discloses that the above-described companion computer system may be a “PDA, a wireless telephone, a laptop PC, a pen-based computer, or any other electronic system to which it is desired to input data” (see column 8, lines 29-33), and that the user may input e-mail into the computer system (see column 8, lines 45-49). It is consequently understood that this companion computer system may be a wireless communicator providing email communication functionality, as 1s well known in the art. As described above

in the rejection for claim 1, the companion computer system of Rafii particularly comprises a projector, a sensor, and alpha-numeric information generation circuitry, like that described in claims 40 and 41, and which projects a an image of a keyboard onto a surface, senses user interaction with specific locations of the projected keyboard image, and generates an alpha-numeric output that may be useful in web browsing, like recited in claims 70 and 71. Such a companion computer system is therefore considered a wireless system, like that recited in claims 40 and 41, and is considered to teach a method, like that recited in claims 70 and 71.

Regarding claims 45, 46, 75, and 76, Rafii discloses that the above-described companion computer system may be a “PDA, a wireless telephone, a laptop PC, a pen-based computer, or any other electronic system to which it is desired to input data” (see column 8, lines 29-33). It is consequently understood that this companion computer system may be a wireless communicator providing mobile commerce communication functionality, as is well-known in the art. As described above in the rejection for claim 1, the companion computer system of Rafii particularly comprises a projector, a sensor, and alpha-numeric information generation circuitry, like that described in claims 45 and 46, and which projects a an image of a keyboard onto a surface, senses user interaction with specific locations of the projected keyboard image, and generates an alpha-numeric output that may be useful in web browsing, like recited in claims 75 and 76. Such a companion computer system is therefore considered a wireless system, like that recited in claims 45 and 46, and is considered to teach a method, like that recited in claims 75 and 76.

Claims 33 and 80 are rejected under 35 U.S.C. 102(3) as being anticipated by U.S. Patent No. 6,690,357, which is attributed to Dunton et al. (and hereafter referred to as “Dunton”). In general, Dunton discusses methods and devices for inputting data and commands into computer systems, such as notebook computers or personal digital assistants (PDAs) (see column 1, line 52 – column 2, line 10). Dunton particularly proposes configuring such computer systems to project an image of a keyboard and a mouse, which may be used to enter data into the computer system (for example, see column 2, line 59 – column 3, line 8). Thus regarding claims 33 and 80, Dunton discloses that a computer system may comprise a projector, for projecting an image of mouse functionality onto an inert surface in front of the computer system (see column 2, line 47 – column 3, line 8). Such a companion computer system also includes a sensor, specifically a “scanning sensor,” which is for detecting user interaction with specific locations of the mouse image (see column 2, line 34 – column 3, line 15). Lastly, it is understood that this computer system also comprises cursor control information generation circuitry at the output of the sensor, the cursor control information generation circuitry providing a cursor, i.e. pointer, control output to a display (see column 2, line 59 – column 3, line 4). This computer system described by Dunton is therefore considered an apparatus, like that recited in claim 33, and is considered to teach a method, like that recited in claim 80.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-16, 30, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rafii, which is described above, and also over U.S. Patent No. 6,435,682, which is attributed to Kaelin et al. (and hereafter referred to as "Kaelin"). As shown above, Rafii presents a companion computer system, which like the apparatus recited in claim 1, comprises a projector for projecting an image of a keyboard onto an inert surface. Rafii, however, does not go into great detail in describing this projector, only that it comprises a laser or other light source, and a lens upon which is etched a diffractive pattern to serve as a mask (see column 10, lines 41-56). Consequently, Rafii does not explicitly disclose that the projector comprises a mirror directing light passing through the mask onto an inert surface, as is recited in claim 14, or that the projector comprises a lens directing light from the light source through the mask, as is recited in claim 15. Rafii further does not explicitly disclose that the projector comprises a spatial light modulator, like expressed in each of claims 30 and 62.

Kaelin complements the teachings of Rafii, detailing a projector system used to project images onto an inert surface (see column 1, lines 48-59). Specifically like Rafii, Kaelin discloses that such an image projector system comprises a point light source, such as a laser, which illuminates a mask provided by a spatial light modulator in order to produce an image onto an inert surface (see column 2, lines 38-54; and column 3, line 38 – column 4, line 3). Regarding

the claimed invention, the image projector system of Kaelin comprises a mirror, to direct light passing through the mask onto the inert surface (see column 3, lines 30-37), and a lens, to direct light from the light source through the mask (see column 4, lines 27-39).

It would have been obvious to one of ordinary skill in the art, having the teachings of Rafii and Kaelin before him at the time the invention was made, to modify the companion computer system taught by Rafii to include the projector system of Kaelin in order to project the keyboard image. It would have been advantageous to one of ordinary skill to utilize such a combination because the projector system of Kaelin requires less energy than conventional projectors, as is taught by Kaelin (for example, see column 5, lines 19-40). An energy efficient projector is beneficial in a companion device, such as that taught by Rafii, which normally comprises a limited energy source.

Claims 18, 31, 32, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rafii and Kaelin, which is described above, and also over U.S. Patent No. 6,690,357, which is attributed to Dunton et al. (and hereafter referred to as "Dunton"). As shown above, Rafii and Kaelin present a companion computer system, which like the apparatus recited in claims 13 and 30, comprises a mask, specifically a spatial light modulator, which when illuminated by a point light source produces an image of a keyboard on an inert surface. Kaelin teaches that the spatial light modulator may be dynamic, meaning that it is responsive to electrical input for producing a dynamic image on the inert surface (see column 4, lines 40-52). However, the projected keyboard taught by Rafii is static, and therefore, it is understood that the projector taught by the combination of Rafii and Kaelin, which projects this keyboard, does not

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necessarily comprise such a dynamic spatial light modulator or mask, like expressed in claims 18, 31, and 63. Moreover, neither Rafii nor Kaelin disclose that the projector also projects an image of mouse functionality onto the inert surface, whereby as expressed in claim 32, user interaction with this image of mouse functionality is sensed.

Like the above-described combination of Rafii and Kaelin, Dunton presents a means for entering data into a computer system, whereby the computer system comprises a projector for projecting an image onto an inert surface, and comprises sensors to detect interaction with this image (see column 1, line 52 – column 2, line 10). Specifically regarding the claimed invention, Dunton proposes projecting an image of a keyboard and a mouse (see column 2, line 47 – column 3, line 8). In response to user interaction with the projected images, such as “movement” of the mouse or “depression” of a keyboard key, the image may be dynamically modified to reflect the user’s interaction (see column 3, lines 9-14; and column 6, lines 17-26).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rafii, Kaelin, and Dunton before him at the time the invention was made, to modify the companion computer system taught by Rafii and Kaelin, such that it also projects an image of a mouse, and includes a dynamic spatial light modulator, i.e. mask, in order to modify the projected images in response to user interaction, as is done by Dunton. It would have been advantageous to one of ordinary skill to utilize such a combination, because as is demonstrated by Dunton, the resulting input interface appears and behaves more like conventional input devices for computers.

Claim 79 is rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rafii, which is described above, and also over the U.S. Patent of Dunton, which is additionally described above. As shown above, Rafii teaches a method like that recited in claim 49, and which comprises projecting a keyboard onto an inert surface, and sensing user interaction with the projected keyboard. Rafii, however, does not explicitly disclose that an image of mouse functionality is also projected onto the inert surface, whereby as expressed in claim 79, user interaction with this image of mouse functionality is sensed.

Like Rafii, Dunton presents a means for entering data into a computer system, whereby the computer system comprises a projector for projecting an image onto an inert surface, and comprises sensors to detect interaction with this image (see column 1, line 52 – column 2, line 10). Specifically regarding the claimed invention, Dunton proposes projecting an image of a keyboard and a mouse (see column 2, line 47 – column 3, line 8). In response to user interaction with the projected images, such as “movement” of the mouse or “depression” of a keyboard key, the image may be dynamically modified to reflect the user’s interaction (see column 3, lines 9-14; and column 6, lines 17-26).

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rafi and Dunton before him at the time the invention was made, to modify the companion computer system taught by Rafi such that it also projects an image of a mouse, as is done by Dunton. It would have been advantageous to one of ordinary skill to utilize such a combination, because as is demonstrated by Dunton, the resulting input interface appears and behaves more like conventional input devices for computers.

Claims 34, 37, 39, 42, 44, 47, 64, 67, 69, 72, 74, and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over the U.S. Patent of Rafii, which is described above, and also over U.S. Patent No. 6,266,048, which is attributed to Carau, Sr. (and hereafter referred to as "Carau"). As described above in the rejections for claims 36, 41, 46, 66, 71, and 76, Rafii presents a companion computer system, which may be a wireless communicator providing web browsing functionality, email functionality, and/or mobile commerce communication functionality, and which comprises a projector for projecting an image of a keyboard onto a surface in front of the companion computer system. Rafii, however, does not explicitly disclose that this projector also projects an image of a display onto the surface, as is recited in each of claims 34, 37, 39, 42, 44, 47, 64, 67, 69, 72, 74, and 77.

Like Rafii, Carau presents a means for entering data into a computer system, whereby the computer system comprises a projector for projecting an image onto an inert surface, and comprises sensors to detect interaction with this image (see column 1, lines 12-36). Specifically regarding the claimed invention, Carau proposes projecting an image of a keyboard and a display (For example, see column 1, lines 56-65).

It would have been obvious to one of ordinary skill in the art, having the teachings of Rafii and Carau before him at the time the invention was made, to modify the companion computer system taught by Rafii to also project an image of a display, as is done by Carau. It would have been advantageous to one of ordinary skill to utilize such a combination, because projecting a display allows the computer system to be smaller, as is taught by Carau (see column 1, lines 12-36). Regarding the claimed invention, it is understood that this projected display may comprise images produced during web browsing, messages produced during email

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communication, or images produced during mobile commerce communication communication, which are common in displays of companion computer systems like those taught by Rafii.

Claims 38, 43, 48, 68, 73, and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rafii and Carau, which is described above, and also over U.S. Patent No. 6,593,944, which is attributed to Nicolas et al. (and hereafter referred to as "Nicolas"). Regarding claims 38 and 68, the combination of Rafii and Carau presents a companion computer system, which like the apparatus and method expressed in claims 37 and 67, respectively, comprises a projector for projecting an image of a keyboard and a display onto a surface, and a sensor for sensing user interaction with the projected keyboard. It is understood that the projected display may particularly comprise images produced during web browsing, a conventional function of such companion computer systems. Neither Rafii nor Carau, however, explicitly disclose that the sensor senses user interaction with specific locations on this projected display, and that web browsing input circuitry at the output of the sensor provides a web browsing output based on user actuation of locations on the projected display, as is expressed in claims 38 and 68.

Like Rafii and Carau, Nicolas discusses companion computer systems, such as PDAs and cellular phones, and regarding the claimed invention, Nicolas describes the use of such companion computer systems to display and browse web pages (see column 1, line 33 – column 2, line 14). Nicolas particularly teaches that a companion computer system may display a web link, whereby in response to detecting user actuation of this web link with a stylus, a web browsing output, specifically a web page, is provided (see column 11, lines 52-67).

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Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of Rafii, Carau, and Nicolas before him at the time the invention was made, to modify the companion computer system taught by Rafii and Carau, such that the sensors also detect user interaction with the display, as is done by Nicolas. It would have been advantageous to one of ordinary skill to utilize such a combination because, as is demonstrated by Nicolas, the ability to directly interact with the display is useful in particular applications, such as web browsing.

In reference to claims 43, 48, 73, and 78, the above-described companion computer system of Rafii, Carau, and Nicolas comprises a projector to project a display, and circuitry to output data in response to user actuation of specific locations on the projected display. It is understood that the projected display may comprise images produced during email communication or mobile commerce communication, which are common functions of such companion computer systems. Consequently, it is further understood that the sensor of the companion computer system senses user interaction with specific locations on the projected display, and that the circuitry at the output of this sensor may provide a mobile commerce or email communication output based on detected user interaction with specific locations of the projected display.

### *Conclusion*

The prior art made of record on form PTO-892 and not relied upon is considered pertinent to applicant's disclosure. The applicant is required under 37 C.F.R. §1.111(C) to consider these references fully when responding to this action. The Arnon and Platzker et al.

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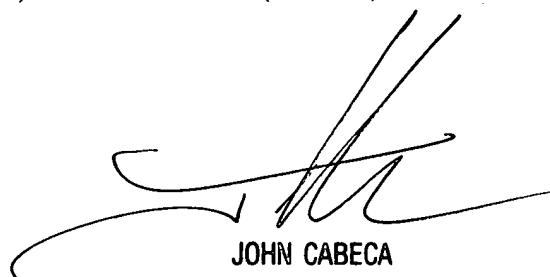
U.S. Patents cited therein each teach methods for projecting an interface onto a surface, whereby a user may input information into a computer system by interacting with the interface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blaine Basom whose telephone number is (703) 305-7694. The examiner can normally be reached on Monday through Friday, from 8:30 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cabeca can be reached on (703) 308-3116. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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